ABSTRACT
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Title of diploma thesis: Automation of chemiluminescence determination of ATP by reaction with luciferase

This thesis deals with the development of methods for automating the chemiluminescence determination of ATP by reaction with luciferin-luciferase system. The aim was to test the possibilities to replace the original manual batch method with SIA method. Analyses were performed by sequential injection analysis with two manners of detection. The detector with a spiral flow cell and the detector with a discontinuous flow cell to monitor reaction kinetics (values of chemiluminescence were readed at time 25, and 30 s) were used. Two different volumes (10 and 20 μl) of injected sample were used within the analyses.

The calibrations were measured and calibration curves were calcuated with correlation coefficients of 0.9994 and 0.9894 for the first detector and 0.9953, 0.9951 and 0.9982, 0.9972 for the second detector. The repeatability of the method, calcuated as relative standard deviations were ranged up to 6%. The results of samples with known concentration matched the calibration curves with variations probably caused by high sensitivity of detectors to the ambient light.

Under defined conditions and in the current setup the method was not robust and accurate enough. For increase efficiency of this method is need of further method development.